

Figure 1

Isoprenoid Pathway in *E. coli*

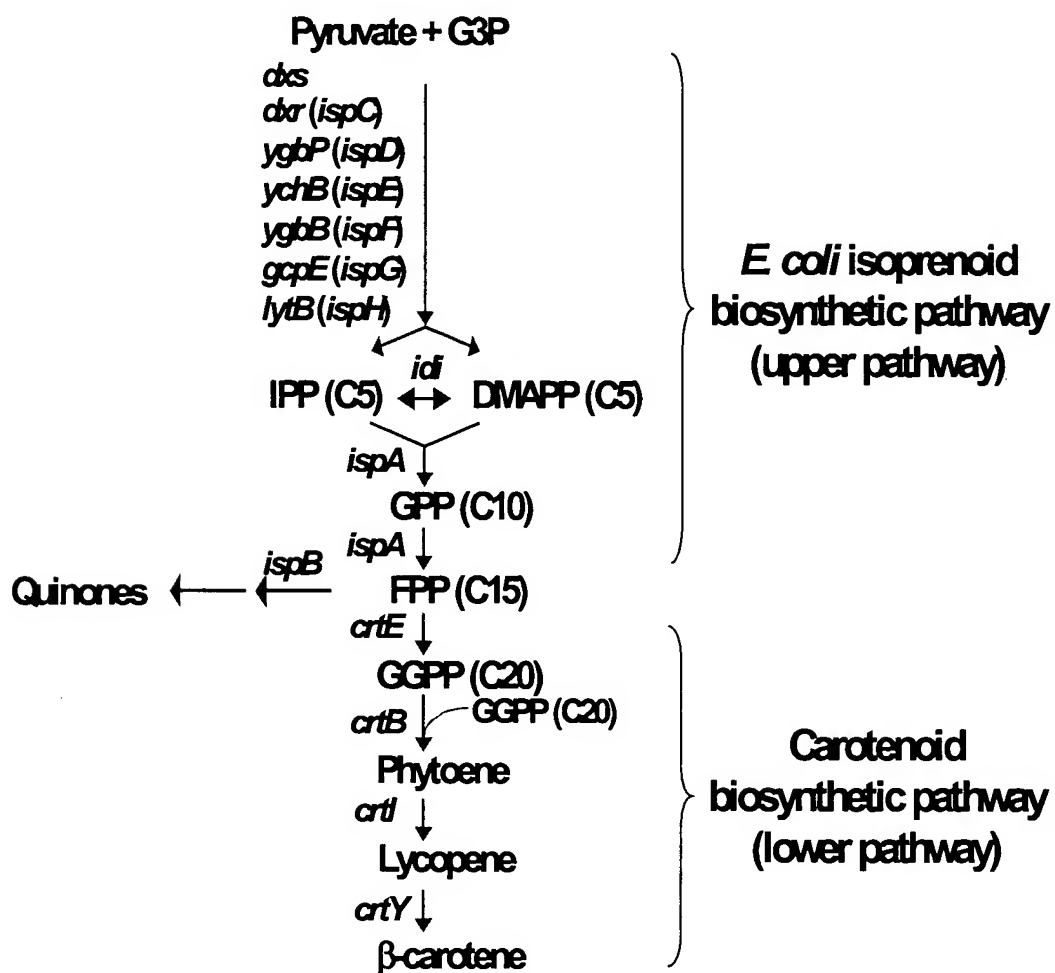
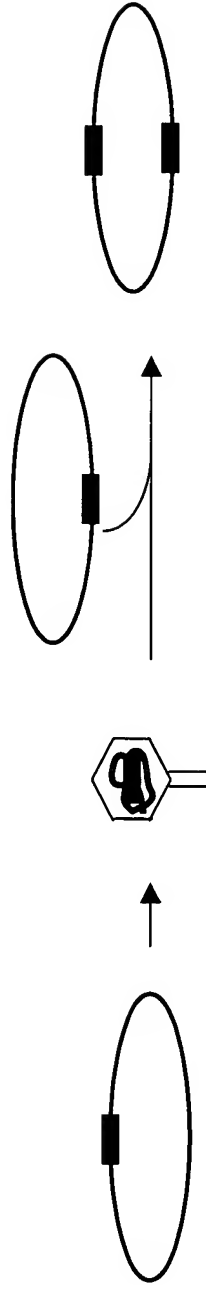


Figure 2

• Conventional P1 transduction:



Combinatorial P1 transduction:

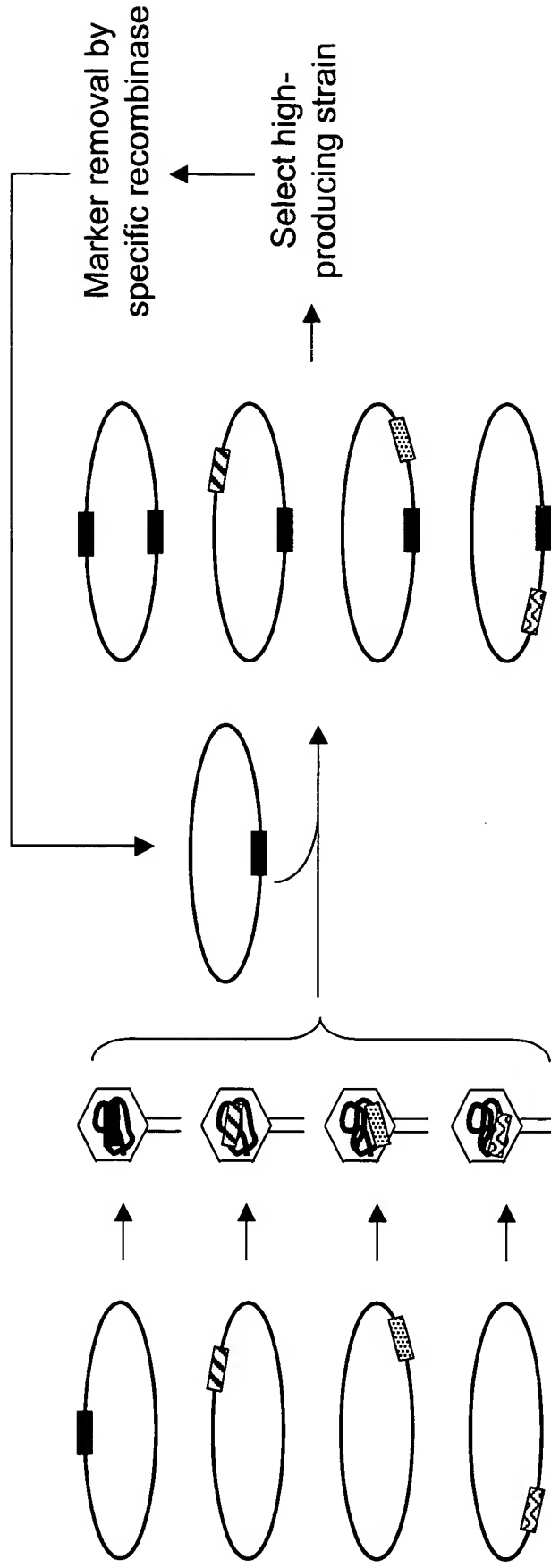
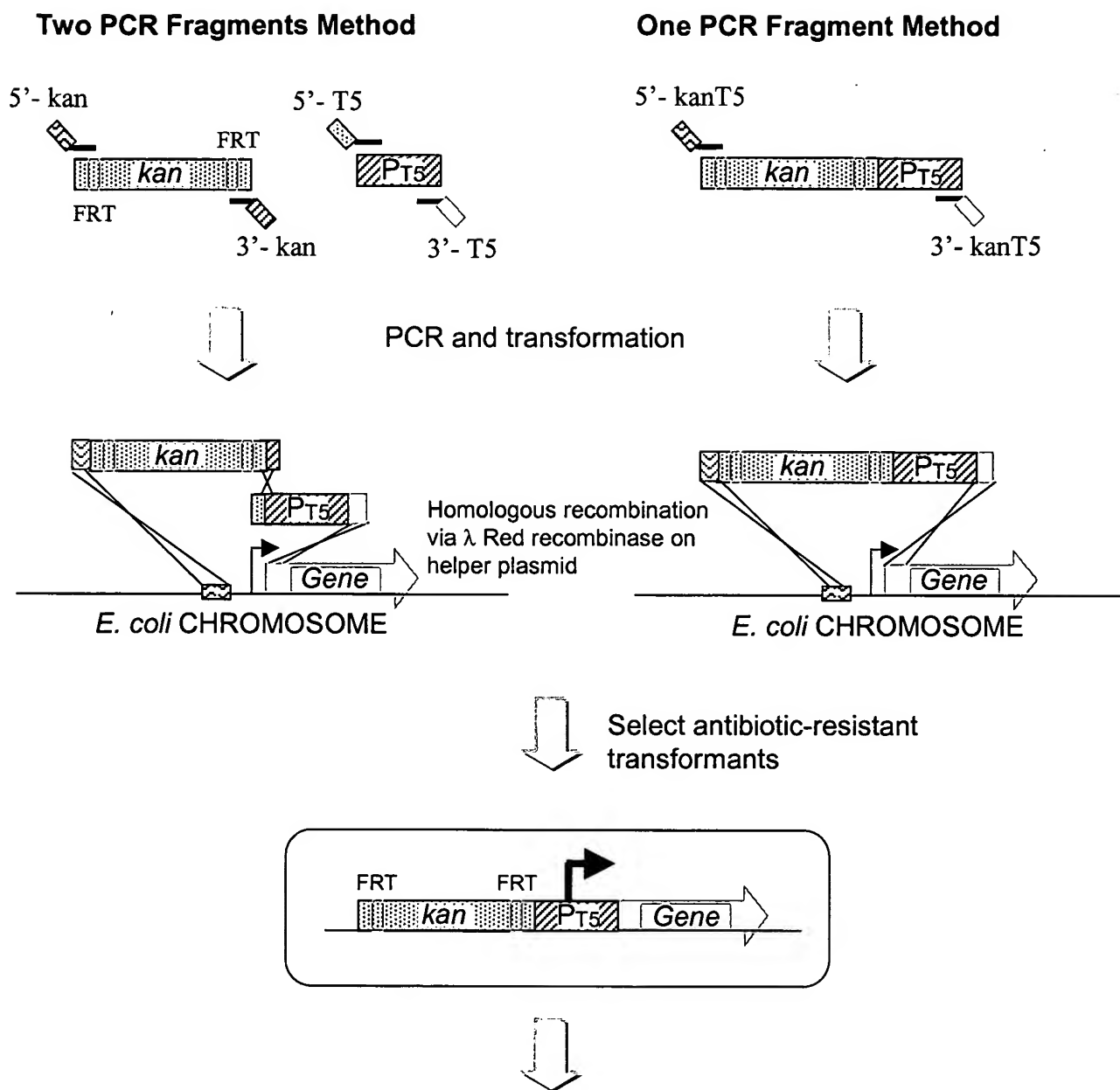


Figure 3



E. coli strains constructed via the above method: Chromosomal integration of phage T5 promoter(P_{T5}) in the front of the isoprenoid genes

<i>Kan-P_{T5}-dxs</i>	<i>Kan-P_{T5}-dxr</i>	<i>Kan-P_{T5}-ychB</i>
<i>Kan-P_{T5}-idi</i>	<i>Kan-P_{T5}-ygbBP</i>	<i>Kan-P_{T5}-gcpE</i>
<i>Kan-P_{T5}-lytB</i>	<i>Kan-P_{T5}-ispA</i>	<i>Kan-P_{T5}-ispB</i>

Figure 4

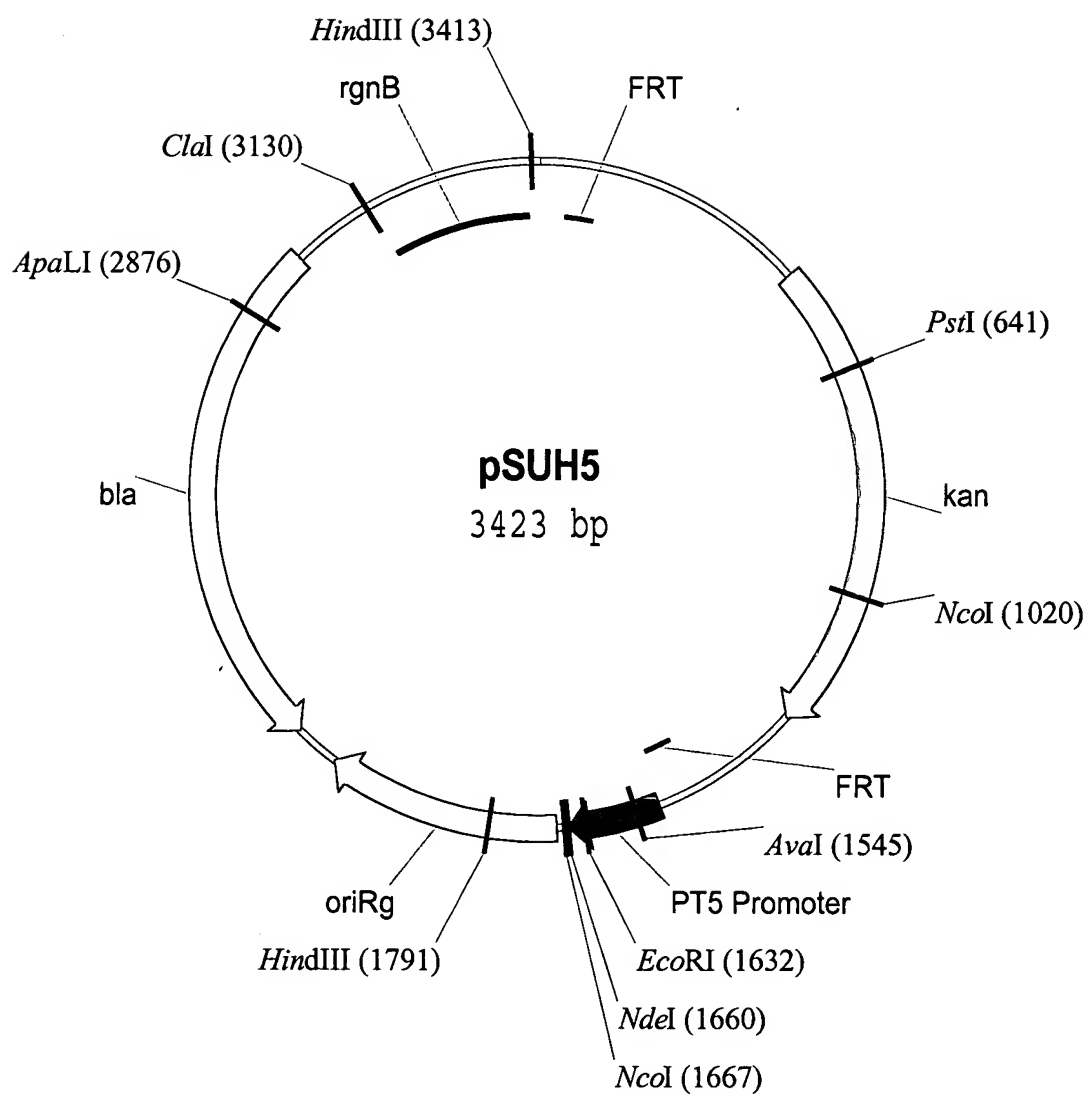


Figure 5

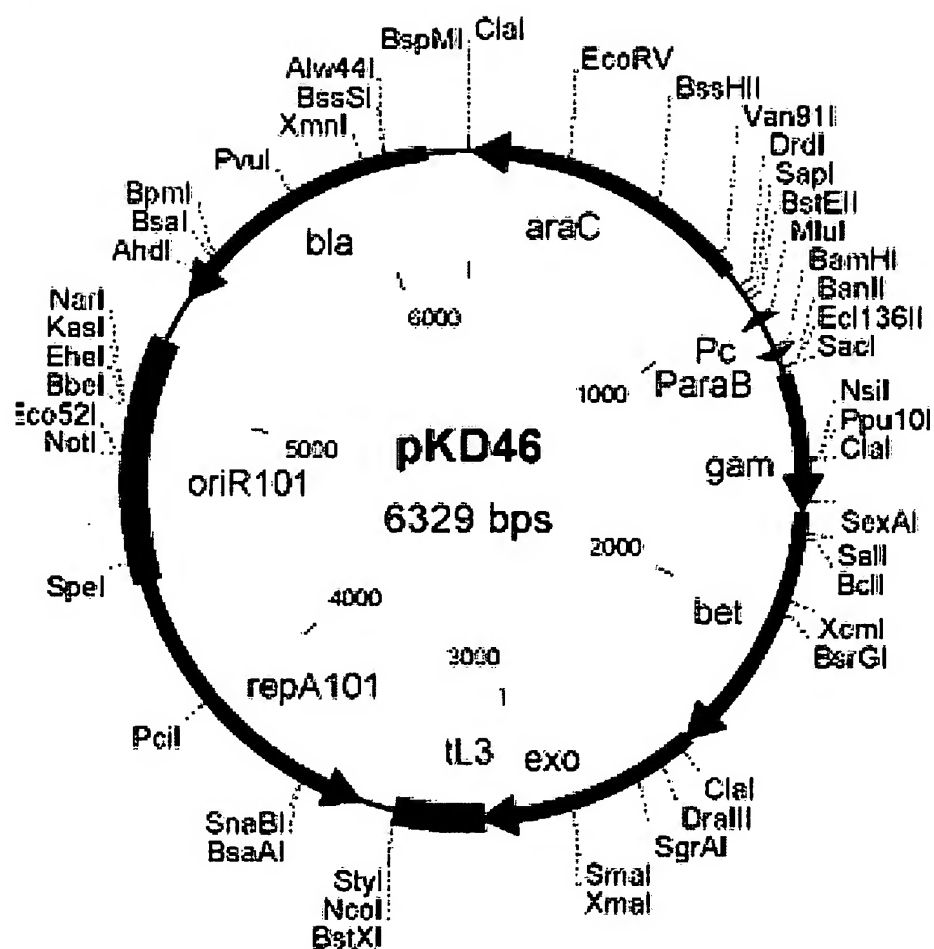
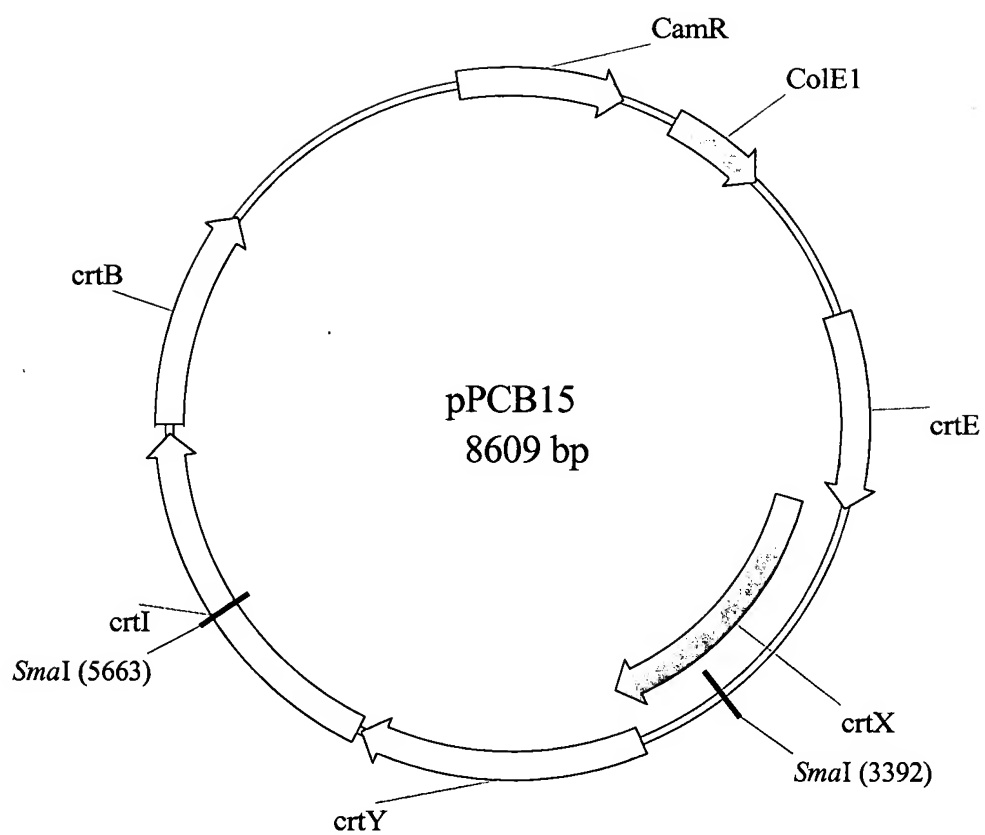


Figure 6



Combinatorial Approach to Increase β -carotene

Figure 7

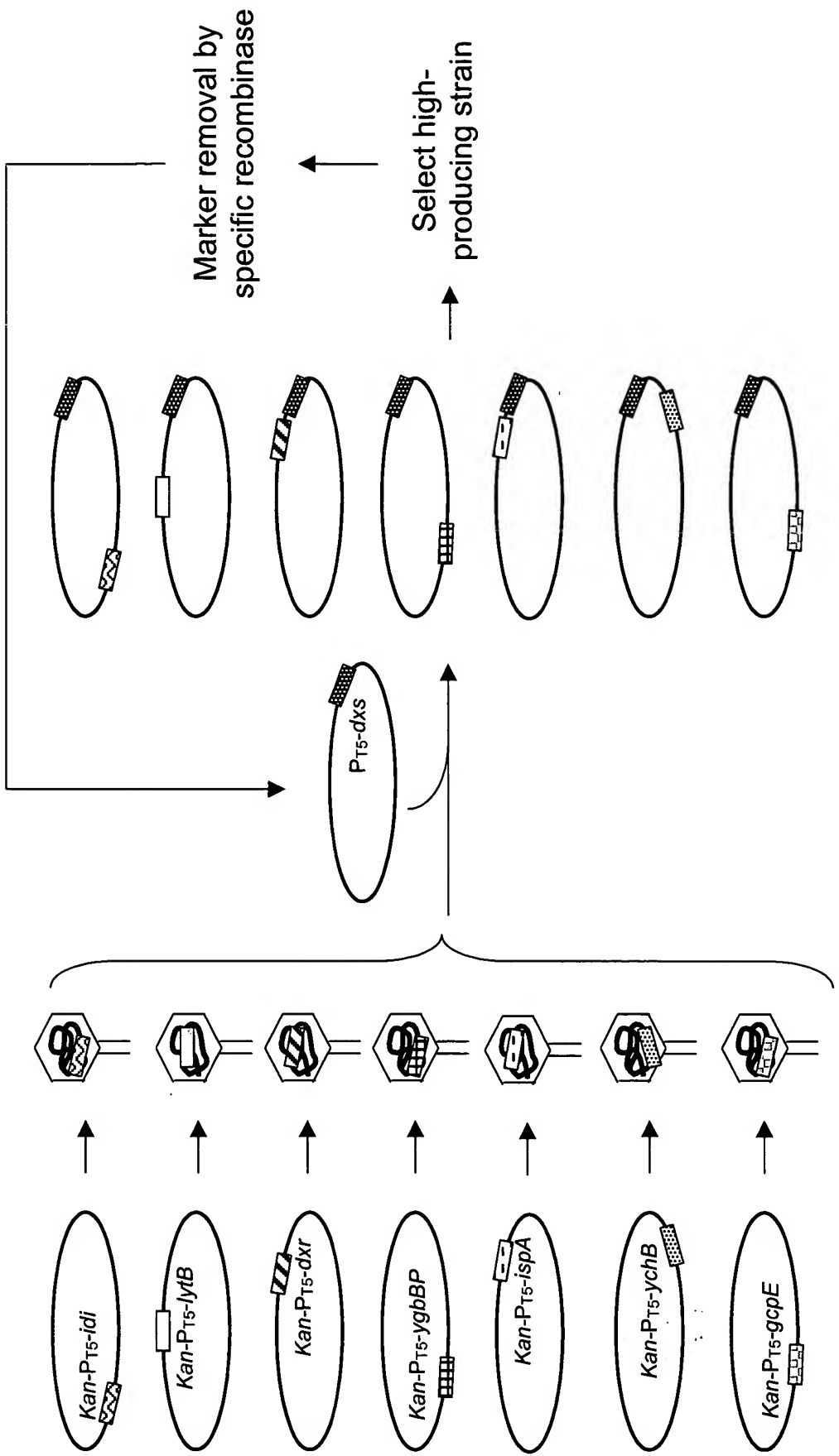
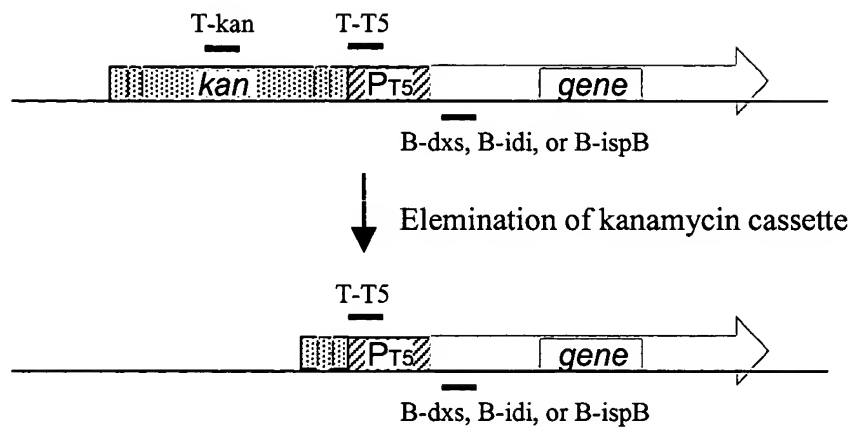


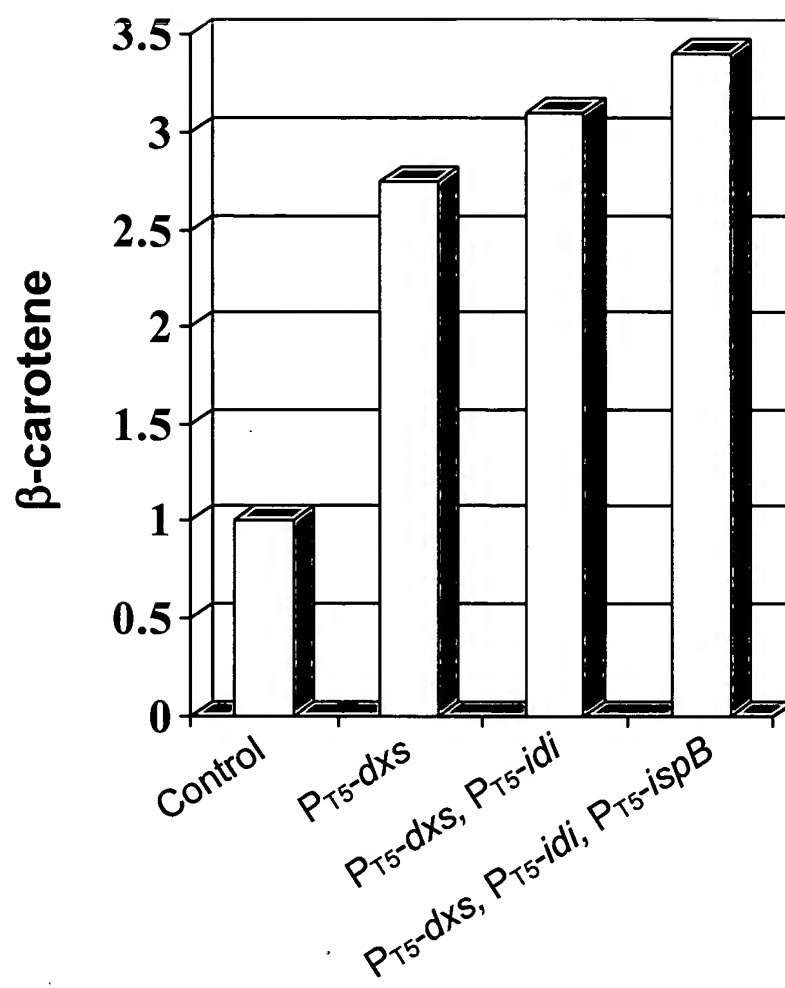
Figure 8



	1	2	3	4	5	6
5'-primer	T-T5	T-kan	T-T5	T-kan	T-T5	T-kan
3'-primer	B-dxs	B-dxs	B-idi	B-idi	B-ispB	B-ispB
Expected size	229bp	1116bp	274bp	1161bp	203bp	1090bp



Figure 9



Control: *E. coli* pPCB15 containing carotenoid biosynthesis gene cluster (*crtEXYIB*)